

# Town of Needham

# Annual Water Quality Report

## Water Testing Performed in 2019



The Town of Needham is pleased to present its Annual Water Quality report covering all testing and water infrastructure projects performed in calendar year 2019. The Needham Water & Sewer Division continues to be proactive, managing challenges, including national concerns over lead pipes, and actively maintaining infrastructure. The Division strives to serve the community by providing safe drinking water in a courteous, efficient and environmentally sustainable manner. Please take a few minutes to read this report and learn about Needham's water system.



Presented By  
Needham Water & Sewer Division, PWS ID# 3199000



## Where does the Town's water come from?

The Town of Needham's primary source of water is the Charles River Well field. From this location, water is drawn from three ground water wells and treated at the adjacent Charles River Water Treatment Facility. The Town's secondary source comes from the Massachusetts Water Resources Authority (MWRA). MWRA water is primarily utilized in the summer, when demand is at its highest. The MWRA supply is conveyed through a pipe from the MetroWest Tunnel in Weston to a booster pump station on St. Mary Street. The water distribution system includes 146 miles of water mains and two elevated water storage tanks (Dunster & Birds Hill) that have a combined capacity of 4 million gallons. In 2019, Needham averaged just above 3.2 million gallons per day, of this amount 77% was produced from its primary source, and 23% from its secondary source.



Charles River  
Water Treatment  
Facility



Saint Mary Street  
Water Pumping  
Station

## Source Water Protection

To ensure the highest quality of drinking water for residents, the Town of Needham has adopted by-laws and health regulations designed to preserve and protect existing and potential sources of drinking water supplies and conserve natural resources. The Massachusetts Department of Environmental Protection (MassDEP) approved the Town's water source protection strategy based on land use and operational restrictions in areas of influence to the Town's drinking water wells. The information collected was incorporated into the Source Water Assessment Protection (SWAP) report. The report is a planning tool to support local and state efforts to improve water supply protection. The assessment helps focus protection efforts on appropriate best management practices and drinking water source protection measures. Residents can help protect sources by taking hazardous chemicals to hazardous material collection days and by limiting the use of pesticides and fertilizers. The Town has three drinking water wells located within one water supply protection area.

The complete SWAP report is available on line at:  
<https://www.mass.gov/eea/docs/dep/water/drinking/swap/nero/3199000.pdf>

## Needham's Water Treatment Process

In order to maintain compliance with Federal and State Drinking water standards, the Town of Needham's well water must be treated before it reaches consumers' taps. The Charles River Water Treatment Facility removes manganese by oxidation and filtration. The Division treats drinking water with the following processes:

- **Chlorine:** used as a disinfectant to prevent bacteria. Adding chlorine aids in the removal of iron and manganese during greens and filtration. Chlorine levels are continuously monitored and controlled to ensure that disinfection residuals are maintained at the facility and throughout the distribution system.
- **Sodium Hydroxide:** used to raise the natural pH and alkalinity of water to reduce the corrosion of lead and copper from household plumbing systems.
- **Ortho-polyphosphate:** a food-based additive that is added to minimize calcium precipitating in hot water systems.
- **Fluoride:** added to prevent tooth decay. In the Town's system, the fluoride level is adjusted to an optimal level, averaging 0.7 parts per million (ppm) to improve oral health in children. At this level, it is safe, odorless, colorless, and tasteless.



All components of the water distribution and treatment processes are closely monitored by State-certified operators through a computerized Supervisory Control and Data Acquisition (SCADA) system. According to the water quality results, shown on the following page, Needham's water complies with all State and Federal regulations. The table contains only the contaminants that were detected in Needham's water supply, although the compounds are below the Maximum Contaminant Level (MCL) set by the EPA. The Town understands how important it is for residents and businesses to be aware of what is in their water.



## Water Hardness Guide

This information is provided so that residents can adjust their appliance settings.

Needham's water is moderately hard, with an 80 range of detection.

NOTE: 1 Grain per gallon (gpg) = 17.1 ppm

AMOUNT (PPM)	RATING
<60 ppm	Soft
61-120 ppm	Moderately hard
121-180 ppm	Hard
>181 ppm	Very hard

# Water Quality Results

PG. 3

## Tested After Treatment

Compound Unit of Measure	Year Sampled	MCL Highest Level Allowed	Amount Detected	Range of Detections	Violation	Typical Source
Chlorine (ppm)	2019	4 MRDL	0.75 avg	0.63-0.86	No	Water additive for disinfection
Fluoride (ppm)	2019	4 MRDL	0.72 avg	0.60-0.85	No	Water additive which promotes strong teeth
Manganese (ppm)	2019	0.05 SMCL	0.008 avg	0.003-0.016	No	Naturally found mineral in the earth
Iron (ppm)	2019	0.3 SMCL	0.01	ND-0.01	No	Naturally found mineral in the earth
Total Coliform	2019	No more than 5% of samples positive in a given month		Highest # of Positive Samples 2*	No	Naturally present in the environment

\* Follow up testing confirmed negative coliform at positive test sites.

## Regulated Contaminants

(TTHM) Total Trihalomethanes	2019	80 ppb	28.8 (LRAA)	11,0-49	No	Byproducts of water disinfection	
(HAA5) Haloacetic Acids	2019	60 ppb	9.9 (LRAA)	2.1-27	No	Byproducts of water disinfection	
Nitrate	2019	10 ppm	0.96	0.96	No	Runoff from fertilizer use, leaching from septic tanks	
Perchlorate	2019	2 ppm	0.07	0.09	No	Rocket propellants, fireworks, flares, blasting agents	
Barium	2018	2 ppm	0.070	0.070	No	Discharge of drilling wastes and from metal refineries. Erosion of natural deposits.	
Compound Unit of Measure	Year Sampled	90th Percentile	AL	MCLG	# of Sites Sampled	Sites above the action level	Typical Source
Lead (ppb)	2017	3 ppb	15	0	30	0 (Residential)	Corrosion of household plumbing
Copper (ppm)	2017	0.03 ppm	1.3	0	30	0 (Residential)	
Lead (ppb) *	2019		15	0	21	0 (Schools)	
Copper (ppm) *	2019		1.3	0	21	0 (Schools)	

Note: Public Schools are not included as part of the 90<sup>th</sup> percentile.

\* In conjunction with the MWRA Broadmeadow, Mitchell and Pollard schools were sampled as part of the Board of Health Division protocol.

## Secondary Contaminants

Compound Unit of Measure	Year Sampled	SMCL	MCLG	Range of Detections	Violation	Typical Source
Chloride (ppm)	2019	250	NA	96	No	Runoff/leaching from natural deposits.
Hardness (ppm)	2019	NO MCL	NA	78	No	Presence of multivalent cations such as Calcium & Magnesium
Sodium (ppm)	2018	NO MCL	NA	80	No	Natural sources and runoff from use of salt on roadways.

Unregulated Contaminants	Year Sampled	Range Detected (ppb)	UCMR: (Unregulated Contaminant Monitoring Rule)
Chromium (total)	2013-2015	0.21-0.32	Unregulated contaminants are those for which the U.S. EPA has not established drinking water standards. The purpose of monitoring unregulated contaminants is to assist the EPA in determining their occurrence in drinking water and whether future regulation is warranted. Note: Next round of sampling will be in 2020
Chromium -6	2013-2015	0.095-0.134	
Strontium	2013-2015	35.3-142	
Chlorate	2013-2015	36-187	

## Per-and Polyfluoroalkyl Substances

Unregulated Contaminant	Year Sampled	Result or Range of Detected	Average Detected	SMCL	ORSG or EPA Health Advisory	Possible Sources
Perfluorooctanesulfonic Acid (PFOS)	2019	3.66 to 6.15 ppt (ng/l)	4.91 ppt (ng/l)	NA	20 ppt (ng/l)	Surfactant or emulsifier, used in fire-fighting foam, circuit board etching acids, alkaline cleaners, floor polish, and as a pesticide active ingredient for insect bait traps. U.S manufacture of PFOS phased out in 2002, however, PFOS still generated incidentally.
Perfluorooctanoic Acid (PFOA)	2019	3.49 to 6.06 ppt (ng/l)	4.78 ppt (ng/l)	NA	20 ppt (ng/l)	Perfluorinated aliphatic carboxylic acid, used for its emulsifier and surfactant properties in or as fluoropolymers (such as teflon), fire-fighting foams, cleaners, cosmetics, greases and lubricants, paints, polishes, adhesives and photographic films.
Perfluorohexanesulfonic Acid (PFHxS)	2019	1.67 to 2.49 ppt (ng/l)	2.08 ppt (ng/l)	NA	20 ppt (ng/l)	Man-made chemical, used in products to make them stain, grease, heat and water resistant.
Perfluoroheptanoic Acid (PFHpA)	2019	0.86 to 1.13 ppt (ng/l)	1.00 ppt (ng/l)	NA	20 PPT (ng/l)	Man-made chemical, used in products to make them stain, grease, heat and water resistant.
Perfluorononanoic Acid (PFNA)	2019	0.54 to 0.86 ppt (ng/l)	0.70 ppt (ng/l)	NA	20 ppt (ng/l)	Man-made chemical, used in products to make them stain, grease, heat and water resistant.
Perfluorodecanoic Acid (PFDA)	2019	0.13 ppt (ng/l)	0.13 ppt (ng/l)	NA	20 ppt (ng/l)	Man-made chemical, used in products to make them stain, grease, heat and water resistant.

**ppm** = parts per million **ppb** = parts per billion **ppt** = parts per trillion

**ND** = non-detected **NA** = non-applicable **ng/l** = nanograms per liter

**90<sup>th</sup> Percentile** – Out of every 10 homes sampled 9 were at or below the AL.

**Action Level (AL)** - The concentration of a contaminant that, if exceeded triggers treatment or other requirements that a water system must follow.

**Chlorine Residual** – Is the low level amount of chlorine remaining in the water after a certain period or contact time after its initial application. It constitutes an important safeguard against the risk of subsequent microbial contamination after treatment a unique and significant benefit for public health.

**Environmental Protection Agency (EPA)** - The federal agency responsible for the development of SDWA regulations.

**Department of Environmental Protection (DEP)** - The Massachusetts state regulatory agency responsible for the implementation of the SDWA.

**LRAA (Locational Running Annual Average)** - The average of analytical results for samples taken at a monitoring location during the previous four calendar quarters. Amount detected values for TTHM and HAA5 are reported as LRAA's.

**Maximum Contaminant Level (MCL)** -The highest allowable level of a contaminant in drinking water. MCL's are set as close to the MCLG's as feasible us using the best available treatment technology.

**Maximum Residual Disinfection Level (MRDL)** - The highest level of a drinking water disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**Maximum Contaminant Level Goal (MCLG)** - The level of a contaminant in drinking water below which there is not known, or expected, risk to health.

**Office of Research Standard Guideline (ORSG)** – Provides recommended contaminant levels in drinking water and is set to be proactive against adverse health affects for all people consuming water over a lifetime.

**PFAS (Per-and Polyfluoroalkyl Substances)** – There is currently no drinking water standard for the unregulated contaminants PFAS as a group by the Environmental Protection Agency (EPA). EPA has set Health advisories for two PFAS compounds, PFOA and PFOS. Based on chemical similarities, MassDEP considers four other compounds, PFNA, PFHxS, PFHpA and PFDA, to be of similar concern and has established an Office of Research and Standards Guideline (ORSG) for these six PFAS as a group.

**Safe Drinking Water Act (SDWA)** - The Federal Law that governs the regulation of public water supplies.

**SMCL (Secondary Maximum Contaminant Level)** - The highest level of a contaminant that is allowed in drinking water for the secondary contaminant.

SMCL's are established to regulate the aesthetics of drinking water like appearance, taste and odor.



## Important Health Information

To ensure that tap water is safe to drink, the Massachusetts Department of Environmental Protection (MassDEP) and the US Environmental Protection Agency (EPA) prescribe regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and the Massachusetts Department of Public Health have established regulations that limit contaminants in bottled water which must provide the same protection for public health. Drinking water, including bottled water, may contain small amounts of contaminants. The presence of these contaminants does not necessarily indicate the water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, reservoirs and wells. As water travels over the surface of land or through the ground, it dissolves naturally occurring minerals and other compounds.

### Compounds that may be present in source water include:

**Microbiological Contaminants:** such as viruses and bacteria that may come from sewage septic systems, agricultural livestock and wildlife.

**Pesticides and Herbicides:** that may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

**Inorganic Contaminants:** such as salts and metals that can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

**Organic Contaminants:** synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, urban storm water runoff, and septic systems.

**Radioactive Contaminants:** can be naturally occurring or result from oil and gas production, and mining activities.



Routine water testing is a standard operating procedure of the Needham Water Division.

Some people may be more vulnerable than others to contaminants in drinking water than the general population. Immunocompromised persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice from their health care providers.

Your drinking water is routinely tested for the substances in accordance with Federal and State drinking water regulations. These substances have not been detected or are significantly below the (MCL) maximum contaminant level allowed.

## Important Information from EPA about Lead

Under EPA regulations, the Town of Needham must test tap water in homes that are likely to have high lead levels. These are usually homes with lead service lines. The EPA requires that 90% of the sampled homes must have lead levels below the action level of 15 parts per billion (ppb). To further decrease your potential exposure, you should always use cold water for drinking and cooking.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with old service lines and home plumbing. The Town is responsible for providing high quality water, but cannot control the variety of materials used in plumbing components. When water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking and cooking. If you are concerned about lead in your water please contact the Water Division for further testing guidance. Additional information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the **Safe Drinking Water Hotline** at 1-800-426-4791 or [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

## Lead Testing in Needham Public Schools

The Town of Needham continues to coordinate with the MWRA to provide lab analysis for all drinking water fountains in public schools. The Water Division, in conjunction with the Health Division, has implemented a routine sampling protocol for lead testing in public schools. In 2019, results showed that levels of lead and copper are well below the action level (AL). Please reference the Water Quality Results Table for additional information.



## What can I do to reduce exposure to lead in drinking water?

Any time water has gone unused for more than 6 hours, run each faucet used for drinking or cooking until after the water becomes cold.

Never use hot water from the faucet for drinking or cooking, especially when making baby formula or other food for infants.

Check your plumbing fixtures to see if they are lead-free. Be careful of places you may find lead in or near your home. Paint, soil, dust, and some pottery may contain lead.

Each part of the water system needs routine maintenance in order to maintain a safe and dependable water supply. Listed below are some of the projects undertaken by the Water Division in 2019:

- Upgraded 1,591 older water meters
- Replaced 158 (lead or cast iron pipe) water service connections.
- Repaired 10 water main breaks and 9 service leaks.
- Replaced 9 older fire hydrants to ensure water supply for fire protection.
- Conducted leak detection survey of the entire water system. The survey is necessary to locate and eliminate leaks from the system.
- Conducted Dunster Rd. and Birds Hill water storage tank security and sanitary inspections.
- Installed a static mixer in the Birds Hill water storage tank to maintain overall water quality and an adequate chlorine residual.
- Replaced watermain on Emerson Place.
- Replaced water main on Peacedale Rd (Between Great Plain Ave and Valley Rd).



## Water Conservation

As of May 2018, the Town is no longer mandated by MassDEP to enforce a mandatory water restriction. However, residents and business are still encouraged to conserve water.

Below are some helpful water conservation tips:

- Water your lawn only as needed. Too frequent watering can actually weaken a lawn by encouraging shallow roots. The general rule of thumb is one inch per week, including rain.
- Avoid over fertilizing your lawn. A soil test will show if phosphorus is needed. Fertilizer applications increase the need for water.
- Place a rain barrel under your gutter downspouts to collect rainwater for gardening or landscaping projects. Rain barrels can be purchased at the Needham Department of Public Works. To order, please call the DPW Administration Office at #781-455-7550.
- Timing is critical for lawn watering. Water your lawn overnight or between 5:00AM and 9:00AM. Mid-day watering will result in evaporation.
- Install mulch to keep roots cool and moist. Mulch serves as a ground cover that reduces water evaporation from the soil.
- Install low-flow shower heads and sink aerators to help conserve water inside your home.

## Water Main Flushing



Distribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. Upon entering distribution mains, the water is very high quality, however, water quality can deteriorate in areas over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, flushing removes sediments like iron and manganese. Although they do not pose health concerns, they can affect the taste, clarity, and odor of the water. Flushing helps remove stagnant water and ensures the presence of fresh water with sufficient disinfectant (chlorine residual) levels.

During flushing operations in your neighborhood, some short-term deterioration of water quality though uncommon, is possible. You should avoid tap water household uses at such times. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use.

Flushing operations in Needham typically commence at night in the spring. During this season and time of day, the demand for water tends to be at its lowest.

For additional information about flushing, please visit: [www.needhamma.gov/hydrantflushing](http://www.needhamma.gov/hydrantflushing)

## Cross Connection Control Program

### What is a cross connection?

A cross connection is an actual or potential link between the potable water supply and a source of contamination (sewage, chemicals, gas, etc.). This has the potential of becoming a hazardous situation if the contaminant source were to enter (backflow) into the potable water. Backflow occurs when the water flow is reversed, due to a change in pressure, and water flows backwards, into and through the system. Contamination can also occur when the pressure in the drinking water system drops due to occurrences such as water main breaks and heavy water demand causing contaminants to be drawn (back-siphonage) into the potable water system.

### Where do I find cross connections?

Garden hoses connected to an outside water tap are the most common sources of cross connections in the home. The garden hose creates a hazard when submerged in non-potable water such as a swimming pool or when attached to a chemical sprayer for weed control. Vacuum breakers can mitigate possible cross connections.

### Who protects public drinking water from cross connections?

Your public water supplier is required to survey all industrial, commercial, and municipal facilities to ensure that all cross connections are eliminated or protected by an appropriate backflow device. The water supplier is also responsible for inspecting and testing each backflow prevention device to ensure it is providing maximum protection.

## **Additional Resources**

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### **Environmental Protection**

[www.mass.gov/dep](http://www.mass.gov/dep)

617-292-5500

### **Massachusetts Dept. of Public Health**

[www.mass.gov/dph](http://www.mass.gov/dph)

617-624-6000

### **Massachusetts Water Resources Authority**

[www.mwra.com](http://www.mwra.com)

617-242-5323

### **Department of Conservation and Recreation**

[www.mass.gov/dcr/watersupply.htm](http://www.mass.gov/dcr/watersupply.htm)

617-626-1250

### **US Center for Disease Control and Prevention (CDC)**

[www.cdc.gov](http://www.cdc.gov)

800-232-4636

### **U.S Environmental Protection Agency**

[www.epa.gov](http://www.epa.gov)

800-311-3435

### **List of State Certified Water Quality Testing Labs**

[www.mwra.com/04water/html/testinglabs.html](http://www.mwra.com/04water/html/testinglabs.html)

617-242-5233

## **Questions?**

For more information about this report, or for any questions relating to your drinking water, please call Stephen Cusick, Water Treatment Facility Manager at 781-416-4071 or the Water & Sewer Division at 781-455-7550.

**Committed to Quality**  
Serving the Needham Community since 1889